We claim:

1. A process for hydrogenating a benzenepolycarboxylic acid or a derivative thereof or a mixture of two or more thereof by bringing the benzenepolycarboxylic acid or the derivative thereof or the mixture of two or more thereof into contact with a hydrogen-containing gas in the presence of a catalyst which comprises as active metal at least one metal of transition group VIII of the Periodic Table alone or together with at least on metal of transition group I or VII of the periodic table applied to a support which contains macropores with the proviso that

   if dimethyl terephthalate is hydrogenated, the hydrogenation using a catalyst which comprises as active metal ruthenium either alone or together with at least one metal of transition group I, VII or VIII of the Periodic Table applied to a support, where the support has a mean pore diameter of at least 50 nm and a BET surface area of at most 30 m^2/g and the amount of the active metal is from 0.01 to 30% by weight, based on the total weight of the catalyst, and the ratio of the surface areas of the active metal and the catalyst support is less than 0.05,

   and/or

   a catalyst which comprises as active metal ruthenium either alone or together with at least one metal of transition group I, VII or VIII of the Periodic Table in an amount of from 0.01 to 30% by weight, based on the total weight of the catalyst, applied to a support, where from 10 to 50% of the pore volume of the support is formed by macropores having a pore diameter in the range from 50 nm to 10,000 nm and from 50 to 90% of the pore volume of the support is formed by mesopores having a pore diameter in the range from 2 to 50 nm, where the sum of the pore volumes adds up to 100%. is excluded.

2. A process as claimed in claim 1, wherein the catalyst comprises as active metal

at least one metal of transition group VIII of the Periodic Table either alone or together with at least one metal of transition group I or IV of the Periodic Table applied to a support, where the support has a mean pore diameter of at least 50 nm and a BET surface area of at most 30 m^2/g and the amount of the active metal is from 0.01 to 30% by weight, based on the total weight of the catalyst.

3. A process as claimed in claim 1, wherein the catalyst comprises as active metal at least one metal of transition group VIII of the Periodic Table either alone or together with at least one metal of transition group I or VII of the Periodic Table in an amount of from 0.01 to 30% by weight, based on the total weight of the catalyst, applied to a support, where from 10 to 50% of the pore volume of the support is formed by macropores having a pore diameter in the range from 50 nm to 10,000 nm and from 50 to 90% of the pore volume of the support is formed by mesopores having a pore diameter in the range from 2 to 50 nm, where the sum of the pore volumes adds up to 100%.

4. A process as claimed in claim 1, wherein the catalyst comprises as active metal at least one metal of transition group VIII of the Periodic Table either alone or together with at least one metal of transition group I or VII of the Periodic Table in an amount of from 0.01 to 30% by weight, based on the total weight of the catalyst, applied to a support, where the support has a mean pore diameter of at least 0.1 ìm and a BET surface area of at most 15 m^2/g.

5. A process as claimed in any of claims 1 to 4, wherein the benzenepolycarboxylic acid or the derivative thereof is selected from the group consisting of monoalkyl and dialkyl esters of phthalic acid, terephthalic acid and isophthalic acid, monoalkyl, dialkyl and trialkyl esters of trimellitic acid, trimesic acid and hemimellitic acid, monoalkyl, dialkyl, trialkyl and tetraalkyl esters of pyromellitic acid, where the alkyl groups can be linear or branched and each have from 3 to 18 carbon atoms, anhydrides of phthalic acid,

trimellitic acid and hemimellitic acid, pyromellitic dianhydride and mixtures of two or more thereof.

6. A process as claimed in any of the preceding claims, wherein the support comprises activated carbon, silicon carbide, aluminum oxide, silicon dioxide, titanium dioxide, zirconium dioxide, magnesium oxide, zinc oxide or a mixture of two or more thereof.

7. A process as claimed in any of the preceding claims, wherein the hydrogenation is carried out in the presence of a solvent or diluent.

8. A process as claimed in any of the preceding claims, wherein the hydrogenation is carried out continuously.

9. cyclohexane-1,2-dicarboxylic acid di(isopentyl) ester, obtainable by hydrogenation of a di(isopentyl)phthalate having the Chemical Abstracts registry number (in the following: CAS No.) 84777-06-0;
cyclohexane-1,2-dicarboxylic acid di(isoheptyl) ester, obtainable by hydrogenating the di(isoheptyl)phthalate having the CAS No. 71888-89-6;
cyclohexane-1,2-dicarboxylic acid di(isononyl) ester, obtainable by hydrogenating the di(isononyl)phthalate having the CAS No. 68515-48-0;
cyclohexane-1,2-dicarboxylic acid di(isononyl) ester, obtainable by hydrogenating the di(isononyl)phthalate having the CAS No. 28553-12-0, based on n-butene;
cyclohexane-1,2-dicarboxylic acid di(isononyl) ester, obtainable by hydrogenating the di(isononyl)phthalate having the CAS No. 28553-12-0, based on isobutene;
a 1,2-di-C_9-ester of cyclohexanedicarboxylic acid, obtainable by hydrogenating the di(nonyl)phthalate having the CAS No. 68515-46-8;
cyclohexane-1,2-dicarboxylic acid di(isodecyl) ester, obtainable by

hydrogenating a di(isodecyl)phthalate having the CAS No. 68515-49-1;

1,2-di-C_{7-11}-ester of cyclohexanedicarboxylic acid, obtainable by hydrogenating the corresponding phthalic acid ester having the CAS No. 68515-42-4;

1,2-di-C_{7-11}-ester of cyclohexanedicarboxylic acid, obtainable by hydrogenating the di-C_{7-11}-phthalates having the following CAS Nos.:

111381-89-6,

111381-90-9,

111381-91-0,

68515-44-6,

68515-45-7 and

3648-20-7;

a 1,2-di-C_{9-11}-ester of cyclohexanedicarboxylic acid, obtainable by hydrogenating a di-C_{9-11}-phthalate having the CAS No. 98515-43-5;

a 1,2-di(isodecyl)cyclohexanedicarboxylic acid ester, obtainable by hydrogenating a di(isodecyl)phthalate, consisting essentially of di-(2-propylheptyl)phthalate;

1,2-di-C_{7-9}-cyclohexanedicarboxylic acid ester, obtainable by hydrogenating the corresponding phthalic acid ester, which comprises branched and linear C_{7-9}-alkylester groups.

10. The use of a cyclohexanedicarboxylic ester or a cyclohexanetricarboxylic ester or a mixture of two or more thereof as plasticizer in plastics.

11. Use according to claim 10, characterized in that the plasticizer comprises at least one compound according to claim 9.